

Appl. No. : 10/664,699
Filed : September 18, 2003

SUMMARY OF INTERVIEW

Exhibits and/or Demonstrations

A sample of the actual water heater was shown to the Examiner.

Identification of Claims Discussed

Claims 1 and 14.

Identification of Prior Art Discussed

Mann (1,120,830) and Christopher (EP 0 3823281 A1)

Proposed Amendments

Applicant proposed amend Claims 1 and 14 to recite that the heater is connected to a faucet of a sink in an airplane lavatory.

Principal Arguments and Other Matters

Neither applied reference taught or described the volumetric limitations. In particular, Applicant pointed out that neither reference teaches or suggests that the heater be limited to a capacity of about 14 ounces of water. Applicant explained that, as disclosed in the specification, this capacity was determined through a study directed to water use in an aircraft lavatory. Additionally, this capacity provides a balance between the amount of hot water typically used by users of aircraft lavatories and the total weight and size of the heater. Further, Applicant pointed out that the prior art references do not provide any motivation for using such heaters in the lavatory of an airplane.

Results of Interview

The Examiner did not agree that the arguments overcame the applied combinations.

Appl. No. : 10/664,699
Filed : September 18, 2003

REMARKS

Please reconsider this application in view of the amendments set forth above and the remarks set forth below.

Claims 14-16 Are Definite

The Examiner has rejected Claims 14-16 as indefinite. In particular, the Examiner argues that Claim 14 recites the broad recitation "such as" and the claim also recites "less than," which is the narrower statement of the range/limitation.

Applicant submits that Claims 14-16 were definite as pending but has amended Claim 14 to advance the present application to allowance. In the preamble, Claim 14 recites a "method of heating small volumes of water for intermittent usage, such as for an aircraft wash basin." The Examiner is clearly treating the preamble as limiting in this application. Accordingly, Applicant has amended the preamble to remove the recitation of "such as" and to positively recite that the intermittent usage occurs on an aircraft. This amendment does not narrow the claims.

Reconsideration and withdrawal of the rejection of Claims 14-16 on the grounds of indefiniteness are respectfully requested.

"A Wash Basin" Is Recited in Claim 9

Claim 9 has been rejected because "the wash basin" lacked proper antecedent basis. Applicant submits that Claim 9 as originally filed recited "a wash basin" and, thus, the rejection is improper. Reconsideration and withdrawal of this rejection are respectfully requested.

Claims 1, 4, 6-10, 14-15 and 17-18 Are Patentable

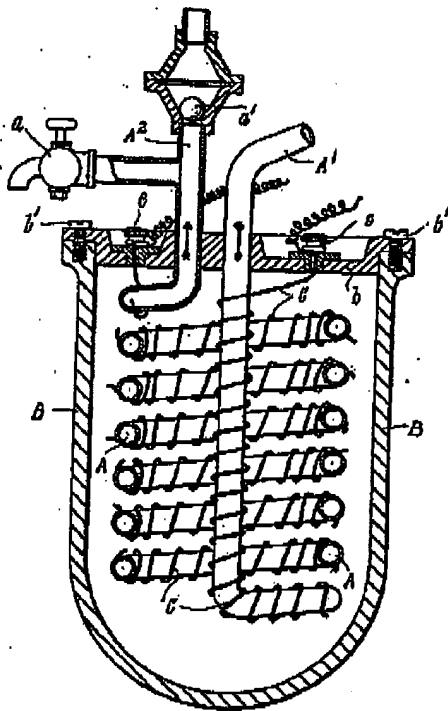
Claims 1, 4, 6-10, 14, 15, 17 and 18 have been rejected as unpatentable over Mann (1,120,830) in view of Christophers (EP350453). Applicant respectfully disagrees.

Claim 1 is independent with Claims 4 and 6-10 depending from Claim 1. Claim 14 also is independent with Claims 15, 17 and 18 depending from Claim 14.

Mann disclosed an electric water heater. At Col. 1, lines 22-36, Mann described a prior device in which a coiled pipe was coated with enamel and a fine resistance wire was wound upon the coiled pipe and embedded within the enamel. Mann then proceeds to explain that such a configuration has serious defects. See Col. 1, lines 48-55. In particular, Mann describes one such serious defect being the heat generated by the wire is free to radiate in all directions and consequently much is lost. Hence, Mann features a similar configuration to the prior art;

Appl. No. : 10/664,699
 Filed : September 18, 2003

however, Mann places his coil in a vacuum. In any event, the coil through which water to be heated passes is wrapped with a resistance wire that is used to heat the water.



One aspect of the present invention provides for a much more compact configuration. As shown to the left, the coil of Mann through which water flows necessarily has large spaces defined between each turn of the coil. The large spaces are necessary to accommodate the resistance wire that wraps the coil. The tight coil with the heater coil that generally follows the path of the tight coil results in a much more compact configuration, which is very important for aircraft applications.

Claim 1

Claim 1 recites, among other limitations, the heater comprising coils with each heater coil being adjacent to a pair of adjacent tube coils but not encircling an axis of said tube. Claim 1 also recites, among other limitations, the substantial length of the tube [along with the heater extends] defining a volume of less than that required to contain approximately 14 ounces of water such that a user on the aircraft can obtain a supply of heated water having a volume of less than approximately 14 ounces before the water heater begins heating a new supply of heated water. None of these limitations is taught or suggested by Mann.

Mann specifically teaches a heater coil that wraps around and along the axis of the tube. Thus, Mann teaches a heater coil that encircles an axis of the tube. Mann also does not teach or suggest a configuration that results in the recited volumetric limitations. To the extent that the Examiner contends that the recited volumetric limitation is an obvious optimization, Applicant submits that the prior art does not recognize the volume of water contained within the heater to be a result-effective variable and, therefore, the recited volumetric limitation cannot be said to be obvious. See *In re Antoine*, 559 F.2d 618, 620, 195 USPQ 6, 8-9 (CCPA 1977).

Appl. No. : 10/664,699
Filed : September 18, 2003

Further, Mann does not teach or suggest an aircraft wash basin being supplied by water heated by the heater.

Christopher also fails to teach or suggest these same limitations. Delphion, an on-line database of patents, sets forth an English abstract for this patent, which abstract reads:

The radiator contains a plurality of heating pipes (5), which are situated one above another and are each bent in an approximately U-shaped fashion and are arranged below a wash stand panel (1) around a wash-basin (2). The horizontally extending heating pipes (5) are each connected at their ends to an approximately vertical supply and return line (6, 7) to form a stable unit. The said unit is fastened by means of fastening lugs or the like to the vertical wall of a building. In this way, the heating device can be installed independently of the wash stand/wash-basin.

There is no teaching or suggestion, however, in Christopher, that the wash basin disclosed by Christopher is supplied with water heated in the heating pipes. Rather, Claim 1 of Christopher describes the heating pipes as being connected to a flow and return pipe of a central heating or domestic water pipe. Thus, Christopher is similar to previously applied DE 3823281 A1, in which the heated water is used to heat a small room, such as a restroom. In fact, Christopher suggests that the heated water in the heating pipes is used to heat the environment because Christopher describes the heating pipes as part of a "radiator," which is another term for a heater.

Accordingly, neither reference teaches or discloses a number of limitations of Claim 1. For instance, neither reference teaches or discloses a heater comprising coils with each heater coil being adjacent to a pair of adjacent tube coils but not encircling an axis of the tube. Moreover, neither reference teaches or suggests a configuration that results in the recited volumetric limitations and neither reference teaches or suggests an aircraft wash basin being supplied by water heated by the heater.

Claim 14

Claim 14 recites, among other limitations, a method of heating small volumes of water for intermittent usage in a wash basin on an aircraft. Claim 14 further recites, among other limitations, a tube and an electric heater in contact over a length that defines a volume of less than that required to contain approximately 14 ounces of water such that a user on the aircraft can obtain a supply of heated water having a volume of less than approximately 14 ounces before the water heater begins heating a new supply of heated water.

Appl. No. : 10/664,699
Filed : September 18, 2003

As explained directly above, neither applied reference teaches or suggests a wash basin, let alone a wash basin on an aircraft. In addition, neither applied reference teaches or suggests a tube and an electric heater in contact over a length that defines a volume of less than that required to contain approximately 14 ounces of water.

Summary

Claims 1 and 14 are patentable over the applied combination. Claims 4, 6-10, 15, 17 and 18 also are patentable over the applied combination for at least the same reasons as the claims from which they depend. Moreover, at least some of these claims recite further patentable distinctions. For instance, Claim 4 recites that the tube has a circular exterior cross-section such that the sections create a recess between the sections and the heater is positioned in the recess. Also, Claim 6 and 7 recite that the heater coils are either on the outside of the tube coils or on the inside of the tube coils. Claim 8 recites that the tube and the heater define a tubular bundle of coils. Claim 17 recites that the coil has an inlet and an outlet and the outlet is in fluid communication with the aircraft wash basin.

Thus, Claims 1, 4, 6-10, 14, 15, 17 and 18 each defines over the applied combination. Reconsideration and allowance of Claims 1, 4, 6-10, 14, 15, 17 and 18 are respectfully requested.

Claim 2 is Patentable Over the Applied Combination

Claim 2 has been rejected as unpatentable over Mann in view of Christopher and further in view of Leuschmer et al. (3,711,681) Applicant disagrees.

Leuschmer is relied upon solely for a teaching of joining a heater to a tube by brazing. Leuschmer does not remedy the deficiencies in the rejection of Claim 1 and, therefore, even when added to the combination relied upon to reject Claim 1, Leuschmer does not render Claim 1 or Claim 2 unpatentable. Reconsideration and allowance of Claim 2 are respectfully requested.

Claims 11-13 and 16 Are Patentable Over the Applied Combination

Claims 11 and 16 have been rejected as unpatentable over Mann in view of Christopher and further in view of Winters et al. Claims 12 and 13 have been rejected over Manner in view of Christopher, further in view of Winters et al and further in view of Alston. Applicant disagrees with both grounds of rejection.

Again, neither Winters et al. nor Alston supplies the teachings required to render Claim 1 unpatentable. Thus, even their addition for limitations recited in dependent Claims 11-13 and 16

Appl. No. : 10/664,699
Filed : September 18, 2003

cannot render these dependent claims unpatentable. Reconsideration and allowance of Claims 11-13 and 16 are respectfully requested.

New Claims 19-25 Have Been Added

Claims 19-25 have been added to protect other aspects of the present invention. As written, Claim 19 recites, among other limitations, a water tube comprising a spiral configuration to define a series of water tube coils, an electric heater comprising a spiral configuration to define a series of electric heater coils, the electric heater coils and the water tube coils have a common axis of curvature and each of the series of electric heater coils being in intimate relationship with only two adjacent coils of the water tube coils. Claim 19 defines over the applied combinations and Claims 20-25 also recite further patentable limitations.

The preamble of Claim 19 is supported by the Abstract. The first set of limitations relating to the water tube and spiral configurations are supported by paragraph [0011]. The second set of limitations relating to the electric heater and spiral configuration are supported by paragraph [0011] and Figures 1-6. The common axis of curvature is supported by the nested relationship shown in Figures 1-6. The intimate relationship limitations are supported by paragraph [0017].

The inside and outside limitations recited by Claims 20 and 21 are supported by paragraph [0017]. The limitations of Claim 22 are supported by paragraph [0011]. The insulating material limitations of Claim 23 are supported by paragraph [0016]. Finally, the temperature responsive switch limitations are supported by Figure 1 and paragraphs [0011] and [0016].

No new matter is being added with these claims. Consideration and allowance of these claims are respectfully requested.

CONCLUSION

For the foregoing reasons, it is respectfully submitted that the rejections set forth in the outstanding Office Action are inapplicable to the present claims. Accordingly, early issuance of a Notice of Allowance is most earnestly solicited.

The undersigned has made a good faith effort to respond to all of the rejections in the case and to place the claims in condition for immediate allowance. Nevertheless, if any undeveloped issues remain or if any issues require clarification, the Examiner is respectfully requested to call

Appl. No. : 10/664,699
Filed : September 18, 2003

Applicant's attorney in order to resolve such issue promptly. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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